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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/820,594	03/29/2001	Joseph Meehan	US010099	6145
24737	7590	05/19/2005	EXAMINER	
PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510			WANG, TED M	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 05/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/820,594

Applicant(s)

MEEHAN ET AL.

Examiner

Ted M Wang

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-20 is/are allowed.
- 6) ☒ Claim(s) 1-4, 10-12 and 21 is/are rejected.
- 7) ☒ Claim(s) 5-9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 December 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. The indicated allowability of claims 1-4, 10-12, and 21 are withdrawn in view of the newly discovered reference(s) to US 4,151,609, US 4,720,812, US 5,530,725, US 5,550,872, US 5,568,443, US 6,438,570. Rejections based on the newly cited reference(s) follow.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: reference 15C in Fig.2 as recited in page 6 line 6. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liberti et al. (US 5,550,872) in view of the admitted prior art of the instant application and Wu (US 6,567,467).

- With regard claim 1, Liberti et al. discloses an apparatus for improving reception in a receiver having N antennae (Fig.2 element 108), where N is an integer number with a value equal to or greater than 2 (Fig.2 element 108), comprising: N first receiver chips (Fig.2 element 218) each associated with one of said antennae (Fig.2 element 108); a digital combiner circuit (Fig.2 elements 218 and 222) for receiving signals from said first receiver chip (Fig.2 element 218), said digital combiner circuit comprising N -1 first buffer memories (Fig.2 element 218 and Fig.3 element 318), (N-1) second buffer memories (Fig.2 element 222 and Fig.3 element 406, *here, examiner is considering N = 2*) and a clock synchronizing module (Fig.2 element 216 and column 6 lines 48-54), with each buffer memory generating an output

signal (Fig.2 element 222 output, column 10 lines 63-67, *here, examiner is considering $N = 2$*);

a common bus coupled to said first receiver chips and said digital combiner circuit (Fig.2 element 218 output to element 222 input, *here, examiner is considering $N = 2$*);

said clock synchronizing module capable of generating a delay signal (column 7 lines 38-59, where the elements 318 and 406 store and then calculated the received signal that is inherently generating a delayed signal.) and aligning said output signal of each buffer memory base on a common clock (column 5 lines 28-49 and column 6 lines 48-54);

said digital combiner circuit capable of generating a combined output signal Fig.2 element 222 output, column 10 lines 63-67, *here, examiner is considering $N = 2$* ; and

a computer (inside of Fig.1 element 120 computer modem) for receiving said combined output signal of said digital combiner circuit (Fig.2 element 222 output).

Liberti et al. discloses all of the subject matter as described in the above paragraph except for specifically teaching -

- a) each chip comprising a front-end section, equalizer, and a back-end section
- b) the computer including said second receiver chip comprising a front-end section, equalizer and a back-end section.

With regard a), the admitted prior art of the instant application teaches a receiver with a single chip including a Front-End and Equalizer and Back-End (Fig.1

elements 15-18) in order to reduce the receiver cost. Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the apparatus as taught by the admitted prior art of the instant application in which, have a single chip comprising a front-end section, equalizer and a back-end section, into Libertis' Branch DSP (fig.2 element 218) so as to reduce the receiver cost.

Liberti et al. and the admitted prior art of the instant application disclose all of the subject matter as described in the above paragraph except for specifically teaching -

b) the computer including said second receiver comprising a front-end section, equalizer and a back-end section.

However, Wu teaches a network interface controller (NIC) inside a computer system (Abstract lines 10-13, column 1 lines 63-67, and column 3 lines 5-20) with an equalizer (Fig.1 element 104). It is inherent that there must be a front- end section to interface the received input signal and it is also inherent that there must be a back-end circuit to interface or receive the equalizer output signal in order to reduce the cost of receiver ASIC and NIC (column 1 lines 45-60).

Liberti et al. and the admitted prior art of the instant application and Wu teaches a second receiver with discrete circuit, front-end, equalizer, and back-end circuit, in a NIC except for specifically teaching the second receiver is a integrated chip. It would have been obvious to one having ordinary skill in the art at the time the invention was made to integrated discrete circuit, front-end, equalizer, and back-

end circuit into a chip, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. Howard v. Detroit Stove works, 150 U.S. 164 (1893).

- With regard claim 2, Liberti et al. further discloses N tuners (Fig.2 element 214) for receiving IF signals from each antenna and converting said IF signals to low IF signals before forwarding said low IF signals (Fig.2 element 220 input) to said first receiver chips. It is inherent that the receiver (214) convert the RF signal to said low IF signal and feed to analog to digital converter input (Fig.2 element 220).
- With regard claim 3, Liberti et al. further discloses N analog to digital converters (Fig.2 element 220).
- With regard claim 4, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liberti et al. (US 5,550,872) and the admitted prior art of the instant application and Wu (US 6,567,467) as applied to claim 1 above, and further in view of Miller (US 6,438,570).

- With regard claim 10, Liberti et al. and the admitted prior art of the instant application and Wu disclose a combiner with DSP as described in the above paragraph except for specifically teaching digital combiner is an FPGA.

However, Miller teaches a FPGA that has been used to implement digital signal processing (DSP) algorithms which are inherently parallel and normally require multiple DSP microprocessors (column 1 lines 35-45) in order to meet the high

data rates and improve the performance and reduce the cost (column 1 lines 46-50). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement the FPGA as taught by Miller to replace the DSP combiner of the Liberti et al. and the admitted prior art of the instant application and Wus' so as to improve the performance and reduce the cost.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liberti et al. (US 5,550,872) and the admitted prior art of the instant application and Wu (US 6,567,467) as applied to claim 1 above, and further in view of Moss (US 4,151,609).

- With regard claim 10, Liberti et al. and the admitted prior art of the instant application and Wu disclose all subject matter as described in the above paragraph except for specifically teaching each of (N-1) first buffer memories is a FIFO.

However, Moss teaches a FIFO (Fig.1A and 1B) with the advantage of a FIFO memory system over a conventional sequential memory system that data can be entered into the memory system at various speeds while at the same time data can be taken out of the memory system at the same or different speeds (column 1 lines 34-50). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement the FIFO as taught by Miller to replace the memory of the Liberti et al. and the admitted prior art of the instant application and Wus' so as to improve the performance and reduce the cost.

Art Unit: 2634

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liberti et al. (US 5,550,872) and the admitted prior art of the instant application and Wu (US 6,567,467) as applied to claim 1 above, and further in view of Kao et al. (US 4,720,812).

- With regard claim 10, Liberti et al. and the admitted prior art of the instant application and Wu disclose all subject matter as described in the above paragraph except for specifically teaching each of (N-1) second buffer memories is a RAM.

However, Kao et al. teaches a RAM (column 1 lines 29-43) with the advantage of high density (i.e., high storage capability per unit volume); high speed and low cost (column 1 lines 34-36). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to implement the RAM as taught by Miller to replace the memory of the Liberti et al. and the admitted prior art of the instant application and Wus' so as to improve the speed and reduce the cost.

8. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liberti et al. (US 5,550,872) in view of Dixon et al. (US 5,568,443).

- With regard claim 21, Liberti et al. discloses a method for improving reception in a receiver having N antennae (Fig.2 element 108), where N (Fig.2 element 108) is an integer number that is greater than or equal to 2, comprising the steps of: receiving N signals from each respective N antennae (Fig.2 element 108) in receiver chips (Fig.2 element 218 and column 6 lines 1-54);

processing the signals in a digital combiner circuit (Fig.2 elements 218 and 222) that includes buffer memories (Fig.2 elements 212 and 218 and column 7 lines 38-59) and a clock synchronizing module (Fig.2 element 216 and column 6 lines 48-54), in order to generate a delay signal (column 7 lines 38-59, where the elements 318 and 406 store and then calculate the received signal that is inherently generating a delayed signal.) that synchronizes and combines output signals from the buffer memories to generate a combined output signal (Fig.2 element 222 output, column 10 lines 63-67); and feeding the combined output signal to a single second receiver chip (Fig.2 element 206 and column 5 lines 28-39). Note that the element 206 is inherent as a receiver chip, since it is a microprocessor, MC6809, as cited, that receives the signal from the combiner chip 222 output.

Liberti et al. discloses all of the subject matter as described in the above paragraph except for specifically teaching N plurality memories.

However, Dixon et al. teaches a single memory that includes N buffer memories (Fig.3, and Fig.4 element 61, column 1 line 50 – column 2 line 20, column 4 line 62 – column 5 line 6, and column 6 lines 36-45).

It is desirable to have a single memory comprising RAM and FIFO buffer memory in order to reduce the higher system cost and power consumption (column 1 lines 36-39). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include the method as taught by Dixon et al. in which, have a single memory comprising RAM and FIFO buffer

memory, into Libertis' combiner chip so as to reduce the higher system cost and power consumption.

Allowable Subject Matter

9. Claims 13-20 are allowed.

10. Claims 5-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is an examiner's statement of reasons for allowance.

- The prior art fails to teach apparatus/method and methods of Claim 13 and 19 that specifically comprises the following:

-- The instant application is deemed to be directed to a non-obvious improvement over the invention patented in Pat. No. US 4,151,609, US 4,720,812, US 5,530,725, US 5,550,872, US 5,568,443, US 6,438,570. The improvement comprises that wherein said third receiver chip receives said combined output signal at said back-end section, and weighting said first and second digital signals based on a signal quality indicator value; adding said weighted digital signals; passing a combined output signal into a back-end section of a third receiver chip as recited.

Conclusion

12. Reference(s) US 5,530,725 is cited because they are put pertinent to the receiver with clock synchronization and delay. However, none of references teach detailed connection as recited in claim.

Art Unit: 2634

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M. Wang whose telephone number is 571-272-3053. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ted M Wang
Examiner
Art Unit 2634

Ted M. Wang



SHUWANG LIU
PRIMARY EXAMINER